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EVOLUTION

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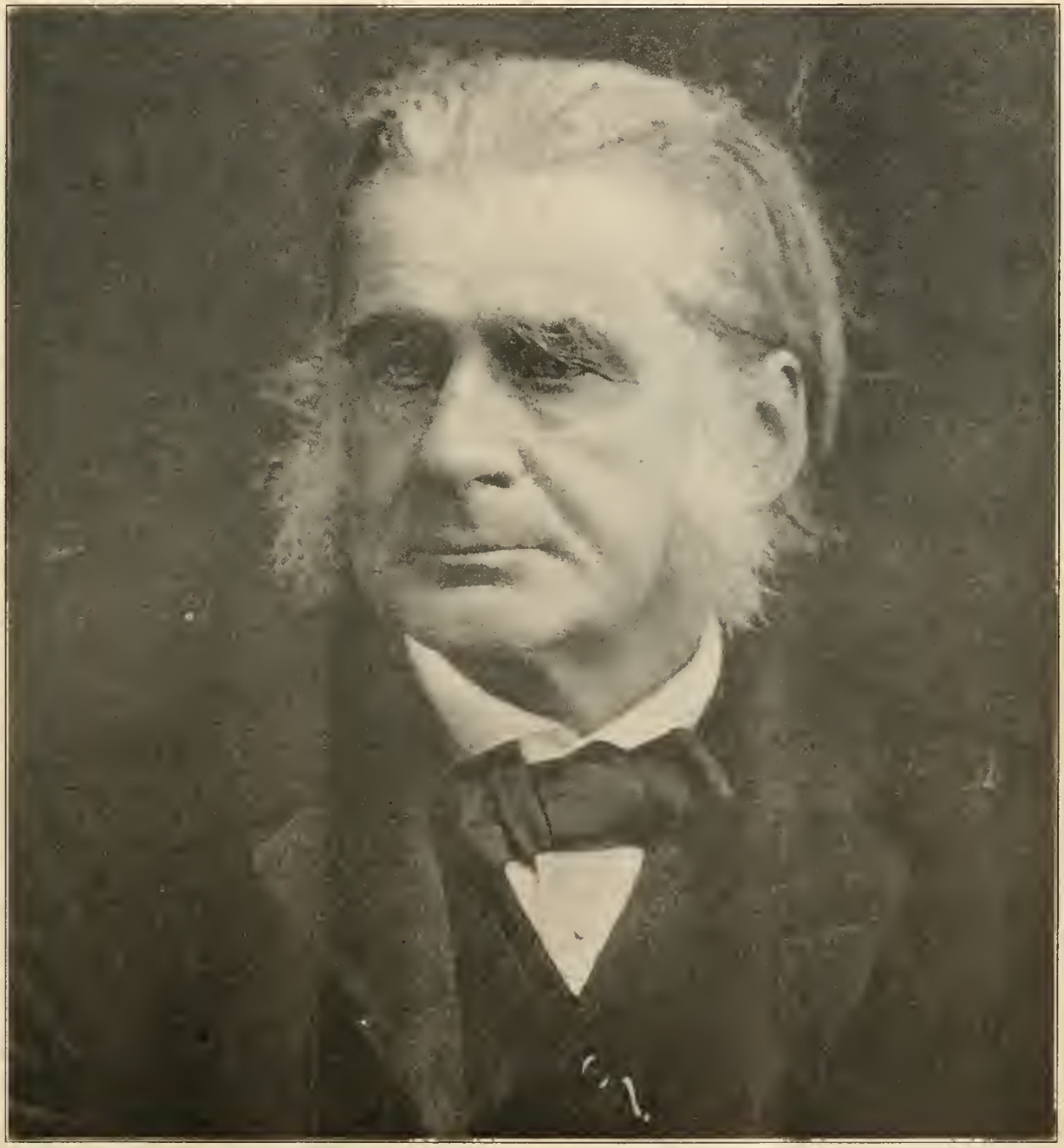
"Logical consequences are the scarecrows of fools and the beacons of wise men. The only question which any wise man can ask himself, and which any honest man will ask himself, is whether a doctrine is true or false."



THOMAS H. HUXLEY

The Life Story of An Eel

By PAULINE H. DEDERER

THE most famous person undoubtedly to inquire into the family antecedents of the eel was Aristotle, who left a record of his opinion that eels have no sexes or eggs, and that they arise from the entrails of the sea. Later speculations, less negative, but no nearer the truth, derived them from snakes, worms, or beetles, and—the latest suggestion, emanating from New England—even from clams.

Development of eel: At first it shrinks in size, then assumes adult shape and starts to grow

Why should it be so difficult to get the facts regarding the development of these bizarre fishes? Anyone who has visited a fish hatchery has probably seen thousands of tiny trout developing from eggs laid and fertilized in the waters of the hatchery. But only four years ago did anyone ever see the egg of an eel, and only one person has ever studied its development.

Now the matter is simplicity itself. All anyone need do is to join a deep-sea exploring expedition, embark on a yacht equipped with the last word in scientific apparatus, and proceed to a region of the Atlantic Ocean southwest of Bermuda—the famed Sargasso Sea where, in 1925, William Beebe and his company of scientists reveled in their "Arcturus Adventure."

Then you may watch the nets go down and scoop up quantities of the surface life of the sea, or plankton. In this oozy "sea soup" may be found the larvae of eels, varying in size from a quarter of an inch to three inches in length, thin as a willow leaf, and of about the same shape. Dr. Beebe described them as "mother-of-pearl eyes swimming round by themselves," the body being perfectly transparent. The finding of the larvae was not a new discovery, for Dr. Johs. Schmidt of Denmark had worked out the astounding migration path of the larvae and their metamorphosis into eels, publishing his results just before the Arcturus Expedition set out. But neither he nor anyone else knew what the larvae came from.

To unravel this mystery, ask the expert on larval fishes for a microscope and one of those pin-head dots of living stuff dredged up from the sea depths, which are engaging her attention. Then, after a few days of more or less constant study—and let us hope the ship is not pitching too much—you may observe, as did Marie Poland Fish, the tiny dot actually transform into a larval eel. This discovery shows the importance of being in the right place at the right time. The right place—and the only place—to answer this question about eels, is in mid-Atlantic, the only region where our eels breed. Thus with a few accessories, like miscroscopes, a ship, patience, scientific training, and immunity from mal-de-mer, the question that perplexed Aristotle is answered. Simple enough!

Now the whole story is known. American and European eels have the same breeding ground, the sea near Bermuda. The larvae drift northward in the currents of the Gulf Stream, changing from leaf-like creatures into small rounded eels, or elvers. The American species seek the various rivers along the eastern shore of the United States, and swarm up-stream in great numbers, even wriggling over grass on rainy nights to reach the land-locked ponds in which they mature. In the fall of the year, the adult eels migrate from inland waters to the sea, traveling months before they reach the Atlantic breeding grounds, there to begin anew the cycle of development, and to die immediately after spawning.

European eels, migrating northward in the same ocean currents, take three years instead of one to metamorphose. They are therefore not ready to ascend rivers when they near our shores and are carried on north-easterly until they reach the shores of Europe. There, as elvers, they ascend the streams and rivers. Dr. Schmidt, in his report on The Breeding Places of the Eel, states that eels have been taken in waters in Switzerland at an altitude of 3,000 feet above the sea. He points out that although extensive migrations of fish are not unusual, the eels are really related to salt-water fishes, and "the remarkable point in their life history is not so much the fact of their migration out to sea to spawn, as in their leaving it in order to pass their period of growth in an environment so unusual for muraenoid fishes as fresh water."

The basis for the idea that eels arise from clams, already referred to, is probably the observation that clams often have a transparent gelatinous rod, about one inch and a half long, protruding from a break in their tissues. This rod is eel-like in form and size, and like the undeveloped eel is also transparent. It is a secretion from the stomach of the clam called the crystalline style. Its function was not definitely known until Dr. Thurlow Nelson of Rutgers University in 1925 explained its importance in aiding to separate the food materials from sand in the digestive tract of the clam.

The Super-Men of Cro-Magnon

By EDWARD GRIEG CLEMMER

THE rock shelter of Cro-Magnon is in the French village of Les Eyzies, in the Dordogne Valley. Here, in 1868, were discovered the first skeletons of Cro-Magnon Man. Many other finds since then make our knowledge of this ancient race of Cro-Magnon very complete.

Cro-Magnon Man, as restored by J. H. McGregor

The Cro-Magnons lived in the Upper Paleolithic age, about 25,000 to 10,000 B.C. This age is divided into three periods, named, in ascending order, the Aurignacian, Solutrean and Magdalenian, after the towns of Aurignac, Solutre and La Madeleine where the first type tools were found. For each period is distinguished by a different kind of tools, the type tools of one period not carrying over into the next, although the same basic design, may be preserved.

The Cro-Magnons were fine physical specimens, some skeletons indicating a height of six feet, four inches. The race as a whole was taller than the average modern European and far taller than the Neanderthal race. Also, the Cro-Magnon walked fully erect and held his head high. His brain equalled or excelled ours in cubical contents. Some have suggested that he might have been a mutation from the Neanderthal, but it is probable that he evolved in Asia and immigrated to the land of the Neanderthal.

In almost every case, the skeletons show care in burial, and at some stations the body was placed in a particular position, surrounded by shells or tools. Sometimes the grave had been filled with a special earth, and one skeleton had been painted red. All this indicates that this people considered burial an important ceremony, and they probably had a belief in an after-life. Certainly they valued the remains of their dead more than had any preceding race.

During the first or Aurignacian period, the cleaver, point and scraper were replaced by improved tools shaped from blade-like flint flakes from which small chips were removed by pressing instead of striking. In this manner, Aurignacian man made knives with an evident handle and sharply pointed gravers for carving on bones and on cave walls. He also made bone and ivory points, cleft at the base for the end of his javelin.

In the Solutrean period the art of flint working by pressure flaking reached its highest development. The most characteristic and beautiful tools were the laurel leaf and willow leaf points, the former two inches to a foot long, symmetrical, evenly flaked, straight, sharp and thin, the latter even more delicate and slender.

But all this marvelous dexterity eventually came to naught, for the Magdalenians who followed paid little attention to flint implements. They did use flint drills, saws, gravers and scratchers, but they made real progress in transforming reindeer horn and bones into javelin points, needles, awls, fishhooks, harpoons and dart throwers.

Where the Magdalenians did excel was in their art, figures carved from ivory and stone, probably of magical significance, perhaps worshipped as idols, and on the walls of their caves, drawings and paintings. In 1878, Marquis Santyola, accompanied by his little daughter, was searching the cavern of Altamira, Spain, for relics of ancient man. Suddenly she cried out,

Painting of Bison in colors, Cavern of Altamira, Spain

"Toros! Toros! (Bulls! Bulls!)", and pointed excitedly to the ceiling of the cavern, all covered with the frescoes drawn by Magdalenian man. Subsequently other caves were discovered in France and Spain, their ceilings and walls similarly covered with drawings, some just outlines, others filled in with bright colors that have not faded to this day.

What happened to Cro-Magnon man we do not know. We do know that he lived in the cold of the Ice Age, and that when the ice melted away to the North, the animals he hunted for food left for colder regions. Some think he followed them and that the Eskimos are his descendants. Their culture is much like his, but their physical characteristics are very different. Probably this prehistoric race of artists just died out. Or the warm weather made life too easy so they degenerated and became the easy victims of more vigorous invaders from Asia or the Mediterranean region. Others, however, think that Cro-Magnon blood still courses through the veins of some Europeans, but of that we can only guess.

Brains—How Come?

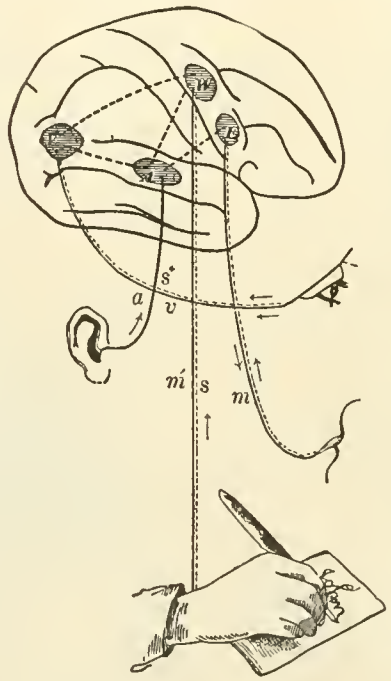
By ALLAN STRONG BROMS

VIII

APE became Man when he learned to talk. For talk gave him thought. No overnight matter, that. It took a million years. For there's a lot behind it: new brain centers, new muscular control, an understanding ear, a wise eye, man's organization of mind.

Our ape ancestors probably had the essential physical equipment, such as vocal cords and muscles, tongue and all the rest, without having learned to use them in real talk. At least not in wordy talk about ideas. They had plenty of feelings, but mighty few ideas. So their first talk was about feelings. With voice of course, but quite as much by grimace and gesture. Crooning tenderness, love's sweet nothings, chattering excitement, screaming anger, bellowing defiance, wailing sorrow, whimpering hunger, all without words.

The first real words were warning cries, and soon, commands to do or not to do. Primitive equivalents of our "Look out!" "Beat it!" "Stop, Look and Listen," "Come and get it." Next they probably named each other and the common things of their lives, and told each other what to do about those things. Very simply, of course. It took a long time before they made up honest-to-goodness sentences, full of "ands, ifs, buts, and hences," descriptive adjectives, modifying adverbs, and all the what-nots of our expressive languages. Such intricate inventions came only as the speech centers of man's brain developed.



Language Centers in Man's Brain
After Breuil
After James

Significantly enough, those speech centers are better developed on one side of his brain. Usually the left side, to go with his normal right-handedness (also under left-brain control). Speech always was mixed up with gestures, and we still talk a lot with our hands. Quite naturally, therefore, the speech centers developed more on the left side of the brain. And it probably helped; that man, for the last few thousand years at least, has been picturing his ideas and writing his talk (again mostly with his skilled right hand). Inevitably, too, the related higher speech centers for understanding the meanings of words heard, of words seen, located themselves largely nearby on the same talk-side.

Belonging together, the various ways of acquiring and expressing meanings became mentally tied together. Things seen, pictures drawn, names heard and spoken, words written, all used together, were kept together in the brain. But not in one brain center. For already each sense and muscle had its own established brain center, and each stayed put, but took its share in the complicated job of talking. Complicated, and more complicated! For towards the end, man made a great invention, a new set of pictures, the letters of the alphabet. Symbols these, just meaning sounds, talking pictures. Man spells them together into words, written as they sound, spoken as written. Handy and lasting. But what a job for his brain! Old brain centers made over, new ones developed, all kept working together by long-distance nerve connections.

But look what it means to man. Without words he could not think, not like a modern. For man thinks with words. Thought is just silent talking. Children think a lot out loud. So do people who live much alone. So do we, muttering thoughts, making lip movements.

Now words can mean one thing, or a group of like things, or the likeness between them, or doings to them. They can mean real stuff, or general qualities, or doings done, and even nothing at all. For one can acquire words with meanings, or empty ones without meanings, beyond sound and spelling. If they mean real things to us, they serve as a mental shorthand for truthful and workable thinking. But if they are empty words, just habits of utterance which we reverence and mouth, they do sad things to our thinking, or what passes for thinking. They may satisfy our minds, and sound like the wisdom of the ages, but they will trick us into mere *wording*. Then we just think we think.

Real thinking is also *wording*, but a different kind. The words have real contents of meaning. They mean real things, real qualities of things, real likenesses between things, real ideas. Because they serve us as mental shorthand, we could never have attained to *human* thinking at all had we not found words to think with. If we watch our words, avoid making them empty sounds, we can keep them useful. The best way is to keep our contacts with fact, through scientific experiment and observation, through practical arts. Only in these worlds of fact can we keep our words full of true meanings. Words like that keep our thinking straight to guide our doing. For truth works.

That, in fact, is the test of truth—it works. Try it on your own ideas. Give your wordings the once over.

Words were the making of man. With speech he passed his ideas around, traded them for a lot more others. But ideas spread by word of mouth are easily twisted, or even lost. Writing solved that problem.

Written words could be kept straight, kept for future generations. Knowledge began to accumulate. Each generation started where the last one left off. Printing helped too. Knowledge could be spread, all over the world, to scholar and layman. With knowledge popularized, nearly everyone was thinking. Bright minds got their starts, emerged to discover and invent, to help lift mankind higher. So the rate of progress increased. More thinking men and women on the job. More tested knowledge to work with. The result—man making his world better, making life happier. It sounds strange. But he talked himself into it.

When Birds Had Teeth

By FREDERIC A. LUCAS

SEPARATED by millions of years from that earliest of all known birds, the toothed Archaeopteryx of the Jurassic period (described last month), the next birds that we know come from the chalk beds of western Kansas. Time enough had passed for members of one group to have quite lost their wings, yet they still retained teeth, the most bird-like of them being quite unlike any modern bird in this respect. The first specimens were obtained by Professor Marsh in his expeditions of 1870 and 1871, but not until a few years later, after the material had been cleaned and was being studied, was it ascertained that these birds were armed with teeth. The smaller of these birds was not unlike a small gull and was, saving its teeth, so thoroughly a bird that it may be passed by without further notice. The larger, however, was remarkable

Drawing by Gleeson

The Toothed Diver, Hesperornis Regalis

in many ways. Hesperornis was a great diver, in some ways the greatest of the divers, slender and graceful in general build, looking somewhat like an overgrown, absolutely wingless loon.

The penguins, as everyone knows, swim with their front limbs—we can't call them wings—which, though containing all the bones of a wing, have become transformed into powerful paddles. Hesperornis, on the other hand, swam altogether with its legs—swam so well with them, indeed, that through natural selection the disused wings dwindled away and vanished, save one bone. Hesperornis was large, upwards of five feet long, and if its ancestors were equally bulky, their wings were quite too big for swimming under water as do the short-winged Auks which fly under water quite as they fly over it. Hence the big wings were closely folded upon the body to offer the least possible resistance, and it was advantageous that they and their muscles dwindled, while the bones and muscles of the legs increased by constant use. By the time the wings were small enough to be used in so dense a medium as water, the muscles had become too feeble to move them, and so degeneration proceeded until but one bone remained, a mere vestige. The penguins retain their great breast muscles, as did the Great Auk, since it takes even more strength to move a small wing in water than a large wing in the thinner air.

As a swimming bird, one that swims with its legs and not with its wings, Hesperornis has probably never been equalled, for the size and appearance of the bones indicate great power, while the bones of the foot were so joined to those of the leg as to turn edgewise as the foot was brought forward, thus offering less resistance to the water. It is remarkable that these leg bones are hollow, because as a rule the bones of aquatic animals are more or less solid, their weight being supported by the water; but those of the great diver were almost as light as if it had dwelt on dry land. That it did not dwell there is conclusively shown by its feet.

The most extraordinary thing about Hesperornis is the position of the legs relative to the body, and this is something that was not even suspected until the skeleton was mounted in a swimming attitude. As anyone knows who has watched a duck swim, the usual place for the feet and legs is beneath and in line with the body. But in our great extinct diver, the joints of the leg bones are such that this was impossible, and the feet and lower legs must have stood out nearly at right angles to the body, like a pair of oars. This is such a peculiar attitude for a bird's legs that, although apparently indicated by the shape of the bones, it was at first thought to be due to the crushing and consequent distortion to which the bones had been subjected, and an endeavor was made to place them in the ordinary position, even at the expense of a dislocation of the joints. But when the mounting of the skeleton had advanced further, it became evident that Hesperornis was no ordinary bird and could not swim in the usual manner, since this would have brought his knee-caps uncomfortably up into his body. And so, at the cost of much time and trouble, the mountings were so changed that the legs stood out at the sides of the body, as shown in the picture, a position verified later by the discovery of the specimen now in the American Museum of Natural History, in which the limbs lay in just the position given them by the artist, Mr. Gleeson.

Hesperornis was probably covered with smooth, soft feathers. This we know because Professor Williston found a specimen showing the impression of the skin of the lower leg, as well as of feathers that covered the "thigh" and head. While such a covering seems rather inadequate for a bird of such exclusively aquatic habits, there seems to be no getting away from the facts. And we do have in the Snake Bird, one of the most aquatic of modern birds, an instance of a similarly poor covering. Its feathers shed the water very imperfectly, and after long-continued submersion become saturated, which partly accounts for the habit the bird has of hanging itself out to dry.

Evolution: Fact or Fake?

Conclusion of the Debate held at Mecca Auditorium, New York, February 7, 1929, between Professor Joseph McCabe of England and Reverend W. B. Riley of Minneapolis on the question: "Resolved, That Evolution Is True and Should Be Taught in the Schools." Two previous issues contained the opening speeches and Professor McCabe's second speech.

THE CHAIRMAN: Dr. Riley again for twenty minutes. (Applause.)

* * *

DR. W. B. RILEY: Mr. Chairman, ladies and gentlemen: In my former address I began where the Professor left off. This time I propose to take the opposite position and begin where he began and track him down.

His declaration that evolution is a science is, as I stated in the first instance, a matter of counting noses. If the scientists agree, that settles it. How can that settle it? If the matter were a matter of science, there would be a demonstration of it. That is what I have listened for, and I have listened in vain.

If there is a living man on the face of the earth that can bring me one instance, either out of geological testimony, or, out of observation, where one species ever evolved into another, he will produce the first argument for this thing that has ever been found.

I want you also to see that the Professor is not sincere in reaching his conclusion, that because scientific men agree he is bound to believe it. He is not sincere.

The scientists of the world in religion are agreed, for the most part, on the existence of a God, certainly as perfectly agreed as the material scientists are agreed upon this subject, for while Evolutionists come to a kindred conclusion, they divide over every point in the so-called progress.

Now, I want to ask the Professor if he will accept these gentlemen, great, outstanding men in the realm of religion, and will go with them for a personal God because they are so overwhelmingly in the majority?

Why isn't the thing that is good in one realm equally good in another?

Here are a few people who have spoken of the existence of God—William James—and this is a matter of philosophy, not a matter of science at all. That is why it was born with the old Greeks. That is why it is reborn at the present time.

But William James opposes the Professor's views as set forth in every one of McCabe's books that I have read. Again, Professor McCabe repudiates the ontological argument of St. Anselm.

He will have none of Father Boedder's arguments.

He will have none of the reasonings of Dr. Warschauer as they proceed from cause to effect. He separates from Sir Oliver Lodge, concerning whom McCabe asserted:

> "He is a man of science and does not eke out his arguments with quotations from ancient authorities or foreigners whose names and authority the reader is not likely to know."

The great Dr. Wallace, the matchless Lord Kelvin, the notable Sir J. J. Thompson, Principal Lloyd Morgan, Dr. Ballard, the immortal Bergson, Eucken, Martineau, LaConte, John Fiske; those several American professors who in 1897 published a book, "The Conception of God"; Dr. Rashdall, Professor James Ward, the seven Oxford men who in 1912 gave to the world their "Foundations," intended as a reconstruction of the Christian belief—these all have written sufficiently well to disturb my opponents and lead them to attempt an answer to each and every one of them, because they are united on the fact that there must be an infinite Creator back of nature; and yet, their united testimony makes no profound impression upon Mr. McCabe, so deeply immersed is he in the atheistic doctrine of evolution.

When Henry Fairfield Osborne, one of our first American scientists, claims, as he does in his recent book, that the great outstanding minds of the world today believe in God, and that many of them are advocates of the Christian religion; and even when no less a name than that of Robert Millikan joins him at once in the exercise of that faith and its far-reaching influence, the united testimony of these is all swept aside by McCabe. For what reason? To save the face of the false and atheistic philosophy of evolution.

With not one of them will he agree concerning God.

Why not be consistent? If we are going to accept this because the scientists say it, why not accept God in His creative acts, because men who are scientists in religion, have agreed upon the subject?

I do not need to tell you that I am not intellectual. The Professor will tell you that. He has already told you of his own! The man who is intellectual will never have to assert it. He doesn't need to assert it.

Now, he said I passed over some of his points. I believe I did, two of them. One of them was about the blue and white and red stars, or, to get them straight, blue, red and white stars. Will you tell me why in the world that confirms the evolutionary hypothesis?

There isn't a single hint in Genesis or a claim on the

part of any living, intelligent man to the effect that God made all stars or siderial systems in one moment. "In the begininng God created the heavens." You can stretch that just as far as you want to.

Go back sixty millions or two hundred and forty millions as others of them say, or go back if you want to into the billions and trillions as others of them say, or go back if you want to to the eternity of matter. Some worlds will be older than others. That is no confirmation whatever of Evolution!

Now, the other thing that I have forgotten to touch upon is that there is not, he said, one single form of life that does not answer to the evolutionary hypothesis. On the other hand, I dare assert that there is not one form of life, known to the human being, that does answer to it. Not one. Not one known living man has ever seen anything in nature's processes that could for one minute be employed as proof that the process known as evolution was going on at all. Not a thing.

I lectured one night in South Minnesota. A boy who had been two years in high school and who had the textbooks given him, came up to me and said:

"You have done very well. I think you have proved that we cannot prove our position. Neither can you prove yours."

I said: "How many illustrations would you like?"

He said: "Give me a few."

I said: "I can give you a million examples right on the farm." Have you ever heard of a hen that hatched anything than a chicken? Have you ever heard of any animal or any plant that produced after another kind? Have you? Varieties, yes, but species, none:

That is the testimony of Bateson, and the moment he said it, they discredited him. If you agree with us, you are a scientist, but if you dissent you are not a scientist and you are ignorant. That is the process of argument that Evolutionists employ.

Bees and ants we can trace farther back than almost anything else. Out of 9,560 separate specimens 93 species and 43 genera Wheeler and Ford said there was not a particle of change in all the ages throughout which they could trace them. No evolution anywhere. There is your case, Professor. You were asking for one. Set that down, if you please.

I read an article in the *Atlantic Monthly* some two or three years ago on evolution wrecked on the bees' knees. I said: "This is news to me." I did not know there were bees' knees. I can prove by the bees' knees that evolution is impossible.

He said that everything that the bee does involves him in sticky stuff. When he varnishes the base to build, when he gets into the comb that he works into the interstices of his body, it is sticky stuff. When he gets nectar, it is sticky stuff. Every single one of them would gum him up in such a way that, like some people—no personal reference, Professor—he would be stuck on himself; he would perish but for one thing: viz., he goes down on his knees and there are combs, and he cleans the antennae and proboscis on the combs.

How many million years would it require for that bee to evolve a comb on his knee that was adequate to its demand, and would it not perish a million times? While waiting the evolution, admit adaptation and you concede intelligent creation.

I want now to conclude what I have to say in this second address by going back again to the question as to whether it should be taught. Here, again, I charge the Professor with insincerity, absolute insincerity.

It is certainly the truth that the great moral law, the decalogue of the Bible, is true. If not, then all the nations of the world—his own included—have gone wrong; and yet he is not in the company of those that have pleaded to have that book placed or retained in the public schools. Not at all. Why not be consistent?

If you are going to teach everything, whether the people want it or not, why not bring the Bible that was banished back? There are only six states that will not permit the Bible to exist in them by law. There are six that demand its reading in the schools. And there are thirty odd that leave it up to the attorney general and to the superintendent of instruction, and in practically every case they have banished the Bible. (Applause.) I know the reason why it is rejected. It is impalatable to infidels and atheists!

If you are going to teach this theory, then teach side by side with it, the creative theory. If we are going to have men lecturing in school on evolution, then I dare them to let me lecture therein on creation. Only in a few instances can we get them to concede that favor.

I am here tonight to tell you that when this doctrine becomes a little more recognized, you will reap the fruitful harvest that is sweeping over our land now.

I spent the past summer in Scotland and Ireland. The overwhelming majority of the people of that country do not believe in this doctrine. They do not believe in it, and I know it from immediate contact with the people. I am not talking to you about a few professors. I am talking to you about people at large.

Unfortunately, a good many of the criminals of that country, just because it is easy to cross the ocean, have come over to our side, and we have more than belong to us. (Applause and hisses.)

There was a time when the deism doctrine—very much akin to this—in fact, it is identical with it in many respects—it says that God had nothing to do with creative acts; that He created the universe, and started it and went off and left it.

Now, they said He did not create it. That is the doctrine of evolution. It leaves God out.

And the Professor himself is a special advocate of the same doctrine that was put into Haeckel's "Riddle of the Universe" ruling God out. (Applause.)

And France went through the strain of deism.

And what was the result? The Reign of Terror.

Professor Williams of Oxford University said of the Nietzsche philosophy—that is this identical thing—that he was the only man that had lived that had the hardihood to carry it to its legitimate results, and when

(*Continued on Page 12*)

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THAT TRUTH MAY PREVAIL

Among scientific men there is a continuous exchange of facts and opinions, the discovery and passing along of new knowledge and a consequent recasting of old theories to fit the new facts. Theories are frankly held subject to change, held now because they seem best to fit the known facts, but pretending to no finality at all. And this attitude holds for even those opinions most firmly evidenced and accepted, as witness the Einstein criticism of the "law of gravitation." Which all goes to say that your typical scientist is modestly open-minded. To him there is no last word, no final authority.

Therefore he is ever exploring, ever criticizing, ever thinking. Out of this comes more knowledge—and clearer theoretical guidance in the quest for still more truth. And it all comes of intellectual honesty which withholds no fact for fear of its logical consequences and spares no opinion whatever its source.

This attitude is one that fundamentalists, set on proving their "word of God," cannot appreciate at its honest worth. When a scientific evolutionist revises his theory, be it in most minor detail, they distort it into a general retreat and proclaim it victoriously far and wide. He honestly states facts that cast doubt and they magnify that into full confession. Your scientist is being honest and they jesuitical. That the truth may prevail, he states the whole case, doubts and all. For the "glory" of their gods they practice sophistry and appeal to prejudice. And so it is that he advances truth, while they obstruct it.—Allan S. Broms.

MECHANIST VERSUS VITALIST

"When the subject (of life) is reasoned about in terms of cause and effect, one group of thinkers, who call themselves *vitalists*, holds that life is due to the presence in living organisms of some 'all-controlling, unknown, and unknowable, mystical, hyper-mechanical force.' Such a view of life is satisfying only to the reasoning of the dogmatic thinker. It does not prove helpful to the scientist because it closes the mind to observable and verifiable fact when in search for truth; it removes the whole subject of adaptation to environment from the realm of investigation. No biologist makes use of such a working hypothesis—however useful the concept may be as a premise for the philosophical reasoning of an absolutist. There is a tinge of vitalism in the philosophy of a goodly number of those who consider themselves scientific; but to this extent they limit the range of their observations—they inhibit the use of their powers of induction.

"A far more satisfactory hypothesis or viewpoint for the study of vital phenomena, and one strictly in accord with scientific method, is called the *mechanistic view*. The viewpoint here taken is that this conception is consistent with the premises and working hypothesis used by the other natural scientists—the only one that is consistent with reasoning about the facts which stare the biologist in the face when he looks at the structure and functioning of organic tissue through a microscope. In other words, the point of view which has proved of the greatest advantage for scientific observation is, that life is a manifestation of energy in a peculiar kind of mechanism—'a new kind of world stuff' which is the physical basis of biological science."—H. H. Newman in "Modern Scientific Knowledge."

REGARDING "THE CAUSE"

IT seems to worry the fundamentalists a lot that "Evolution teaches an effect or result without any cause." If evolution could teach the "cause" it would be an exception to all other natural laws. Does the law that "Water seeks its own level" teach anything about a cause? We know that water does seek its own level, because that happens to be the way this law operates. Through investigation we find that the earth pulls heavier objects toward its center, and this is called the law of gravity. Why accept these laws as perfectly natural, while demanding that evolution show some cause—a supernatural cause preferred?

Dr. David Starr Jordan, of Leland Stanford University, says: "Evolution and nature mean the same thing—'Orderly change.' To say that we should not study evolution is to say that we should not study the earth or the stars, the plants, the animals, the growth of humanity." Luther Burbank says: "Those who would legislate against the teachings of evolution should also legislate against gravity, electricity and the unreasonable velocity of light, and also should introduce a clause to prevent the use of the telescope, the microscope and the spectroscope or any other instrument of precision which may in future be invented, constructed or used for the discovery of truth." Dr. Henry Fairfield Osborn expressed the views of all broadly educated men and women, and completely confuted the claims of "Bible opponents" of evolution, in saying: "No teacher can possibly teach zoology or any other branch of science truthfully and intelligently if evolution is left out; the cutting out of evolution from education is exactly like taking the heart from the body, for evolution is at the very heart or center of education and always will be."

Anti-evolution laws will be ignored the same as the law against teaching that the earth moves. This also conflicts with the Bible which states that Joshua made the sun stand still. Evolution is now being taught in all three of our anti-evolution states, by calling it "development." What I object to is that these laws cultivate hypocrisy. They are turning our schools into "speak-easies" and our teachers into "bootleggers." Bob Lyle.

AN EVENT WE ENJOYED

One of EVOLUTION'S most interested friends, Mr. A. Nielen, a youth of eighty years, world traveler, philosopher and photo artist, was a caller in New York last week. He delighted a group of New York readers of EVOLUTION with a travelog, "A Trip Around The World," showing several hundred beautifully colored lantern slides of "the quaint, the queer and the beautiful," made from photos taken by himself. Mr. Nielen has an exceptional sense for the interesting and picturesque, and some of his slides are the most wonderful we have ever seen. His remarks while showing them were delightfully entertaining and contained many gems of wisdom. We look forward to another showing when he returns.

SKIP SEPTEMBER

Our next issue, Vol. II, No. 6, will be out the last of September, but dated October.

GIVE IT TO YOUR FRIENDS

The article on next page, "Our Knowledge of Man," by Dr. Hrdlicka of Smithsonian Institution, appeared as editorial in The Outlook. We shall reprint it also as a leaflet ($1.00 per 100, $5.00 per 1,000). Help distribute it far and wide.

Our Growing Knowledge of Man

By ALES HRDLICKA

Reprinted by courtesy of The Outlook

An endeavor to account for man's origin has been universal. Study of the myths and beliefs of different peoples shows that there was no tribe, no ethnic group, no religious unit, that did not have some theory, however crude, as to how man came into existence. And before science came in, once an idea became set in any group, it constituted a dogma which effectively stopped or greatly retarded further thought in that direction. Religious dogmas, being directly associated with the deities (revelations), became particularly powerful. Had it not been for the Biblical account, especially, current thoughts about man's origin and his knowledge of himself as well as that of the rest of the living nature, would have developed much earlier.

An analysis of the conceptions reached on the subject before the advent of the scientific period, shows that the numerous forms group themselves into three main classes. They are: (1) wholly thaumaturgic, or (2) partly supernatural and partly natural, or (3) essentially natural.

The first class of theories regard man's origin as due to purely supernatural agencies and means, without speculating as to the details. Many of the anthropogenies of primitive tribes of today, together with those of some of the earlier Greeks, earlier Romans, and one of the versions of the Genesis, are or were of this nature.

The second class of views is subdivisible into two series. In the first, common to the Egyptians, all the Semitic peoples of Asia Minor, some of the Greeks (the Hephaestus myths) and to the second version of the Genesis, man's body is made of earthly materials (clay, bone, blood, etc.), with the life and soul added supernaturally. In the second subclass of these beliefs, common to some of the American Indians and others, man originates supernaturally from subterranean or recently emerged mythical birds or other animal forms.

The third, naturalistic, or scientific category of theories may again be separated into two subclasses. The first, held by some of the early Greek and other philosophers, such as Aristotle, and surviving largely to this day, teach a natural, evolutionary origin of the body, but believe in a distinct and higher origin of the "soul;" while the others claim an evolutionary origin of all man's attributes, physical and intellectual. The great difficulty in both these lines is the lack of a definition of the concept of "soul." Man has never known clearly and does not know yet just what is his "soul."

From the earliest time this third class of views as to man's origin differed widely from both preceding ones in being based on actual observation. In the beginnings, in the time of Anaximander and his followers, the observations were limited, imperfect und empirical; but men were gradually recognizing the close analogies between man and the rest of the organisms which surrounded him in the world.

True scientific observations by learned men, however, and deductions on the problem of human origin began during the latter part of the Eighteenth Century, and hence long before Charles Darwin. They attended on one hand the work of the anatomist and physiologist, on the other that of the naturalist and the geologist-paleontologist.

Buffon, Erasmus Darwin, Goethe, Treviranus, Gall, Geoffroy St. Hilaire, and a good number of others, headed eventually by Lamarck, and later Wallace, precede Charles Darwin; but it is the latter who, in 1871, in his "Descent of Man," gives the first comprehensive treatise on the subjct.

Buffon, Erasmus Darwin (grandfather of Charles) and above all Lamarck, explained evolution by a gradual inheritance of "acquired characters" or structural adaptations, brought forth by environmental conditions. For Charles Darwin and his close followers, the essential factor in evolution, human or animal, was "natural selection" or, as Herbert Spencer termed it, the "survival of the fittest," working with the normal variation of every organism and of every part. Organisms vary; they also increase in numbers; the numerical increase leads to competition and struggle for existence; and in this struggle the most "fit" and best adapted to their environment survive and advance the group in their direction.

Since Lamarck and Darwin, the theory of human origin by evolution has been generally accepted by scientific men and enriched by a whole realm of observations and proofs, until what had originally been a theory has become one of the best documented pages of human knowledge.

At present, the essentials of man's origin through evolution are established facts. Still uncertain are many of the details of the highly complex processes involved, the exact sources from which man developed and the causes and ways of his differentiation; but these do not affect the soundness of the main conclusion.

Meanwhile science is endeavoring to solve more definitely the many still more or less obscure by-problems of human evolution. The efforts are partly a patient intensive search for additional material evidence, partly speculation. It is the latter that is responsible for the various theories as to man's precise ancestry, the exact time of man's appearance, the true cradleland of humanity and the actual modes of human evolution; theories that, because of their variance, are by many mistaken for uncertainties of the main subject. It is such differences that may be seen in the recent writings of Osborn, Gregory, Clark and others. They depend on the basis and angle from which the still imperfectly explored field is contemplated and on other individual conditions. Similar human gropings after truth, before it has been fully revealed in material facts, are common to all branches of science. They are the useful "working hypotheses" of science, lasting until they are shown to be erroneous, or until replaced by better conceptions. They help toward the eventual reaching and crystallization of human knowledge.

Already, however, the cultured man and woman are becoming less curious about their remote ancestors, less concerned about the past, and are directing their attention to the next problems, which are man's further differentiation in the present, with the promises and indications for the future.

OFF WITH THEM FALSE WHISKERS

The Reverend Professor Leander S. Keyser, D.D., in "Bible Champion," May, 1929, page 226:

> "That vehement propagandist, the magazine called *Evolution* . . . tells us some of the authors and publishers of text-books are keeping evolution in their books under cover in a deceptive way . . . cut out the word 'evolution' but inculcate (*sic!*) the doctrine in disguised form. Some people propose simply to substitute the word 'development' which may be used to describe the same doctrine. Let the good people of Tennessee, Arkansas and Texas be on their guard . . . People should remember that it is the theory of evolution that is not to be taught, by whatever name it poses."

Now the curious thing about this passage is that "the theory of evolution" is entirely legal for anybody to teach all he likes anywhere in North America. The only thing forbidden in "Tennessee, Arkansas and Texas" (the monkey states really are Tennessee, Arkansas and Mississippi) is *the descent of man.* If, then, "authors and publishers of textbooks" do not choose to exercise their legal right to include "the theory of evolution" itself under that particular name, or for that matter if they do, why should the Reverend Professor Keyser interfere with them? They are all within their rights under the actual statute.

Hasn't the Reverend Professor read his own fool law? Or does he think that other people haven't? E. T. B.

TWO EXPEDITIONS STUDY APES IN AFRICA

Two scientific expeditions from America are now in Africa studying the apes and primitive man, in both body and mind. One, sent by the American Museum of Natural History and the College of Physicians and Surgeons of Columbia University, includes Henry C. Raven, Associate Curator of Comparative Anatomy at the Museum, with extensive field experience in Africa and the East Indies; William K. Gregory, Professor of Vertebrate Paleontology at Columbia and author of "Our Face from Fish to Man" and other works on evolution; J. H. McGregor, Professor of Zoology at Columbia, authority on the anatomy of apes and man, and E. T. Engle of the College of Physicians and Surgeons, specialist in endocrinology and physiology.

They will study problems of man's evolutionary history and of his physical welfare in the future. On the medical side, studies will be made of posture and faulty mechanical adjustments, of the endocrine glands, of reproductive organs and processes, of blood tests and parasitic conditions. They hold that medical progress must be built upon broader knowledge of the fundamental laws of life and health, upon a better understanding of the origin and functions of the structures of the human body. More specifically, the purposes of the expedition are:

1. To bring back primate specimens for thorough anatomical, physiological and embryological studies under favorable laboratory conditions.

2. To make motion pictures and photographs of aboriginal tribes.

3. To procure complete adult specimens of different species of gorilla, previous specimens of adults having been limited to skins and skeletons. Because the gorilla closely approaches man in body structures, this feature is of outstanding scientific value.

The second expedition, headed by Harold C. Bingham, research associate of the Institute of Psychology at Yale, is working in the Belgian Congo under the auspices of the Carnegie Institution and Yale University, largely on problems of ape psychology. Motion pictures will record the individual everyday life of the African mountain gorillas in the reserve set aside by the Belgian Government for their preservation. Plans call for a whole year in the field.

TO SUPPLY LIBRARIES

Many thousands of people would be reached by the message of EVOLUTION if we could place the magazine in every Public and School Library Reading Room. Most libraries would be glad to display EVOLUTION in their reading room, even though their budgets do not permit them to pay for it. Of course we can not send it free of charge, but we will be glad to supply Libraries at 60c. per year to the extent that our readers will furnish the funds.

A good start for this LIBRARY FUND is given by contributions from two friends, A. Kalmanoff, $50, and W. T. Bush, $20.

Will you also help? Exery $3 will send EVOLUTION one year to five libraries. You may either specify the libraries, or leave the selection to us.

ATTENTION, TEACHERS

A number of science teachers used EVOLUTION in their classes last year with splendid results. Some High School biology departments took 100 copies of each issue.

Our paid in advance bundle rate is only 5c per copy. A bundle of five for the nine issues that will appear during the school year amounts to $2.25, ten $4.50, etc. If you prefer we'll send you as many as you want on consignment at the regular news stand rate of 6c, to be paid after delivery. Simply write us how many to send you. All school orders will begin with the October issue, which will contain no commercial advertising.

PROMOTING EVOLUTION

Our closest friends know that we started without capital and have to raise several hundred dollars to bring out each issue. All surplus above production costs is used for promotion. When sufficient paid circulation has been achieved the magazine will be self-sustaining. In the meantime we invite readers to send funds, and we issue a share of our stock for every ten dollars sent. The following gave their support since the last issue:

M. Vonsovici, $30.00; C. Peter A. Peterson, $10.00; Herman Prange, $3.00; Caspar Hodgson, $10.00; L. T. B. Light, $200.00; W. T. Bush, $20.00; Michael Cohn, $20.00; Joseph Block, $20.00 Martin Dewey, $200.00; John Dequer, $10.00 E. E. Free, $2.50; F. W. Hodge, $4.00; A. S. Keshin, $5.00; C. N. Clauder, $1.00; Anne Frese, $1.00; Bertha W. Howe, $3.00; E. S. Wertheim, $10.00; W. C. Michel, $2.00; Geo. Welby Van Pelt, $2.00; A Friend, $25.00; Mignon Talbot, $10.00; L. D. Abbott, $1.00; Mrs. T. M. Nagle, $5.00; Eda B. Schenker, $4.00; Thos. Capek, $4.00 Minot Simons, $5.00; B. C. Gruenberg, $5.00; J. David Houser, $5.00; Tobias Sigel, $10.00; A. L. Davis, $2.00; Wm. F. Welling, $.50; Ed. Heyn, $1.00; Anna Reinstein, $1.00; Lucy Hall, $5.00.

The work can be pushed just to the extent that funds are furnished. Will you join this goodly group? To help spread the message of EVOLUTION.

The Calf Path

SAM WALTER FOSS

One day through the primeval wood
A calf walked home as good calves
But made a trail all bent askew, [should,
A crooked trail, as all calves do.
Since then three hundred years have fled,
And I infer the calf is dead.
But still he left behind his trail,
And thereby hangs my moral tale.

The trail was taken up next day
By a lone dog that passed that way,
And then a wise bell-wether sheep
Pursued the trail o'er hill and steep;
And drew the flock behind him, too,
As good bell-wethers always do.
And from that day, o'er hill and glade,
Through those old woods a path was made.

And many men wound in and out,
And dodged and turned and bent about,
And uttered words of righteous wrath
Because 'twas such a crooked path;
But still they followed—do not laugh—
The first migrations of that calf,
And through the winding wood-way stalked,
Because he wabbled when he walked.

This forest path became a lane
That bent and turned and turned again;
This crooked lane became a road,
Where many a poor horse with his load
Toiled on beneath the burning sun,
And travelled some three miles in one.
And thus a century and a half
They trod the footsteps of that calf.

The years passed on in swiftness fleet,
The road became a village street;
And this, before men were aware,
A city's crowded thoroughfare.
And soon the central street was this
Of a renowned metropolis!
And men two centuries and a half
Trod in the footsteps of that calf.

Each day a hundred thousand rout
Followed the zigzag calf about,
And o'er his crooked journey went
The traffic of a continent.
A hundred thousand men were led
By one calf three centuries dead.
They followed still his crooked way,
And lost a hundred years a day;
For thus such reverence is lent
To well established precedent.

A moral lesson this might teach
Were I ordained and called to preach;
For men are prone to go it blind
Along the calf-paths of the mind,
And work away from sun to sun
To do what other men have done.
They follow in the beaten track,
And out and in, and forth and back,
And still their devious way pursue.
To keep the path that others do.
They keep the path a sacred groove,
Along which all their lives they move;
But how the wise old wood-gods laugh,
Who saw the first primeval calf.

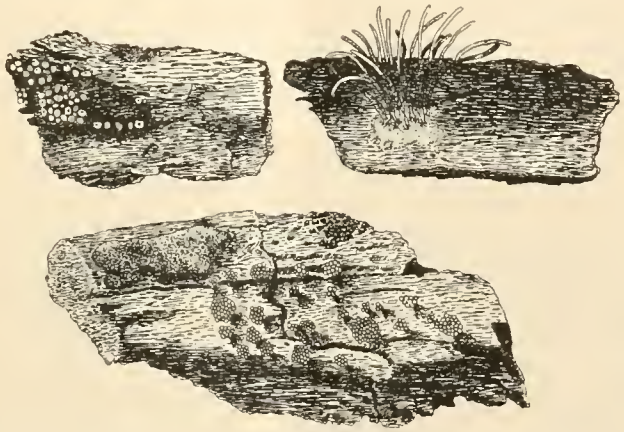
Ah, many things this tale might teach—
But I am not ordained to preach.

The Amateur Scientist

A Monthly Feature *conducted by* Allan Strong Broms

PLANT OR ANIMAL—WHICH:

We rarely have trouble distinguishing plants from animals. Usually animals can move and plants not, animals having nervous reaction systems, while plants have not. But Venus Flytrap and various sensitive plants do react by movement and some very low one-celled plants actually travel. Also, sponges, which are animals, anchor themselves and just vegetate. So the scientist amplifies the popular tests by considering methods of getting food, details of structure, development, behavior, etc. But even the scientist is stuck when he meets the slime-molds.



Three common slime-molds on decaying wood; sporangia of Trichia; of Stemonitis (plasmodium remnant at base); and of Hemitrichia (with plasmodium)

He does not know for sure what they are—plants or animals. Some think them plants and call them Myxomycetes (slime-fungi), while others disagree and call them Mycetozoa (fungus-animals).

What makes the slime-mold so mysterious is that it lives its feeding life as a moving animal, and then settles down and reproduces itself by very obvious plant spores. As an animal, its working body is a mass of naked jelly called a *plasmodium*, suggesting the term "slime," which slips along slowly and engulfs its food like that simplest of known animals, the amoeba. While common in forests, in black soil, fallen leaves and decaying logs, it is seldom noticed, its shapeless yellow or other colored mass looking like nothing in particular. The plasmodium lives in wood and substratumand appears on the surface only when ready to fruit; sometimes it seems to be nothing but a wet spot on the log; usually it is inconspicuously small, occasionally eight inches across.

It is easiest to recognize at its plant stage, although it is then just a scattering of small, almost microscopic, spore cases. But it really looks like something, especially if you get a good close-up through a magnifying lens. Almost over night, the plasmodium jelly has disappeared shaping itself into most elaborate and beautiful spore bearing fruits. These are distinctive for each species and are easy to preserve. If you know what to look for, you can probably find some in your own yard.

But the first time you had better get a guide who knows what to look for and where. But guides are few. The New York Microscopical Society has one in Robert Hagelstein who has specialized on the *Mycetozoa*, for he thinks them animals, and takes us on a couple of "hunting trips" during the year. Sunday morning, July 7th, for instance, we boarded the ten o'clock Long Island train in New York for Mineola where he met us. He took us to a damp forest kettle-hole on the edge of the terminal moraine left by the last great Ice sheet. First he warned us against poison ivy and gave us an antidote to wash our hands with (one part of ferrous chloride to nine parts each of water and glycerine). Next he showed us samples from his own collection and then turned us loose among the dead leaves and rotting logs.

We found plenty of sporangia, but only two or three plasmodia. One of the latter was a greenish-yellow network of slime on the end of a dead twig. Another was just a "wet spot" on a piece of bark, but the wetness showed a pattern, and sporangia were already grown from part of it. Our real harvest was in sporangia. Each of us carried a cigar box and a supply of pins. When we found a colony of sporangia, we broke or cut off a piece of the wood or leaf and pinned it to the bottom of the box. This keeps the specimens from tumbling around and breaking the very delicate spore cases. The later preserving is just a matter of thorough drying and the keeping away of insects.

Our guide told us we had a really poor day, though we felt quite happy in having found so many after such a recent opening of our eyes. But it seems there are three hundred species throughout the world and this one kettle-hole had already yielded about a hundred, a couple of them quite new. We had nothing like that and he was really disappointed, for he knew his logs by their first names and expected much more of them, especially when he brought company. However, there is another day coming, for the slime-molds are to be found from March to December, and we are to have another "hunt" on September 29th, the same guide, the same place, the same train, and the same good time. Incidentally, everyone is invited. Just bring your lunch and a hand magnifier.

EVOLUTION LECTURES

We have arranged a course of ten lectures to be given Saturday evenings, Oct. 12 to Dec. 14, inclusive, in the Labor Temple, 14th Street and Second Avenue, New York.

The general subject will be "Evolution: The Master Key," the idea being not merely to present the conventional evidence for evolution, but rather to show how the idea of evolution illumines every field of natural science today.

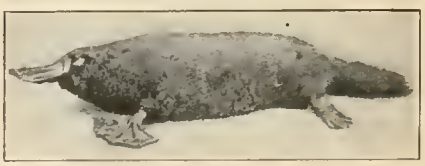
Four of the lectures will be given by Allan Strong Broms, our science editor, whose course of lectures was so well received last spring. The other six will be offered by authorities in the fields of Biology, Anthropology, Astronomy, Geology, Psychology and Education who will tell how the fact of evolution helps them to solve their special problems. Detailed announcement will appear in our next issue.

In the meantime we invite our friends to take course tickets in advance to furnish the necessary funds for advertising. Admission to single lectures will be 50c, but those ordering in advance will get HALF PRICE, that is TWO tickets for the entire course of ten lectures for $5.00. May we hear from you?

The Duck-billed Platypus

A Rhyme,
by Walter C. Kraatz

Of all the Mammals the one most queer,
On all this wide, old, mundane sphere,
Is the so-called duck-billed platypus,
Four legs and fur like a regular "cuss";
But minus teeth; has bill for eats.
Though nourishing young on tiny teats,
She lays her eggs like a regular bird,
Or reptile, no matter if it seems absurd.
It means to us who are able to think:
This beast is a real connecting link.



(*Continued from Page 7*)

he did it it proved a transvaluation of all values and the degradation of all moralities.

As an American citizen born in this country, after generations and generations of ancestral voters, I stand for my land, and while my voice lasts, I expect to lift it up in opposing a doctrine that hasn't a scintilla of evidence in the heaven above, the earth beneath, or the waters under the earth. (Applause.)

I say as a father of six children, as a teacher of four hundred in my school, as a taxpayer, and consequently a citizen, I shall do my utmost to put this thing out of the public schools of America. I thank you.

(Applause and hisses.)

* * *

THE CHAIRMAN: Professor McCabe will now close with five minutes.

PROFESSOR JOSEPH McCABE: I am afraid this audience must be entirely fundamentalist and is trying to prevent me from getting my precious five minutes (referring to prolonged applause). (Laughter.)

Dr. Riley, as I expected, in his first speech declined to follow the lead that I gave him and waited until his second speech, knowing that I have only five minutes to answer that Niagara of argument that he put out. The order of this meeting has been altered at the request of Dr. Riley. After the second speech we were to have ten minutes each in which we might have dealt more or less satisfactorily with each other. As it is, what do you expect me to do in five minutes? Fortunately, the greater part of what Dr. Riley said was entirely irrelevant to this debate tonight.

(VOICES: Right! Hooray! Applause.)

I am appealing only to such members of this audience as are going to give us a sober, intellectual verdict on the question. The best thing that I could do to give Dr. Riley a chance was this: to inform him that all scientific men are agreed. I do not count noses. I did not ask you to believe evolution because all scientific men are agreed. I said if they are all agreed, you will expect something very serious and very substantial from Dr. Riley. Did you get it? (VOICES: No.)

So far as my analysis goes, he has at last given me one thing to reply to. I told him that all the facts of the universe are in keeping with evolution. He asked me to run over all the facts of the universe and show it. (Laughter.) Surely, the best opportunity I could give Dr. Riley was to tell me one that is inconsistent. That is logic. Tell me one that is inconsistent and my case falls. At last I got one supposed inconsistency, the bees. (Laughter.) And once more Dr. Riley does not know the elements of the subject. (Laughter.)

Of fourteen families of bees twelve have no means of making wax or using wax whatever, and the only fossil bees we have belong to those families that never make any wax whatever. Dr. Riley said the bees and ants are the oldest forms of life. They are, on the contrary, amongst the youngest.

I claim, ladies and gentlemen of the jury, I claim that I put before you this statement: The whole universe is the basis of evolution, and Dr. Riley must show you facts which will bring that statement to the ground and show things inconsistent with evolution. He has not done so. I claim, therefore, in conclusion, that this anti-evolution campaign is founded upon a complete ignorance of scientific teaching. (Applause.)

Dr. Riley has accused me of insulting America. I have been for ten years the most friendly interpreter of American life in the whole of Europe. Never for a single moment have I said a word against America. That is why I am here before you tonight.

Well, I submit to you that the doctrine of evolution is proved. This anti-evolution doctrine, which has made America conspicuous before the educational world, is not proved. It rests upon complete—not only complete ignorance, but complete misrepresentation of science from beginning to end. (Applause.) And while I admit that parents can determine what shall be taught to their children, I do not admit that any expert people shall not freely tell parents what is true and what is not true. Who is going to decide? Ladies and gentlemen, I put it up to you. You have seen tonight how the anti-evolution campaign in America is engineered. (Applause.)

I appeal to you. This is my last word, and believe me as in other matters I have been explaining in England for years what is the meaning of the fundamentalist campaign. I ask that New York shall at last assert its rightful position as the cultural leader of one of the greatest civilizations of modern times. I ask that America shall purge its intellectual prestige of this stain that has been imposed upon it, and that you will be prepared to lead, not only your States, but lead the world in wisdom and in justice and in peace. (Prolonged applause.)

* * *

The Chairman took a rising vote of the audience, which expressed itself at least ten to one in favor of Evolution and Prof. McCabe. The vote recorded by the official judges was 12 for the Affirmative and 17 for the Negative, but the poll of the High School Class seated on the stage as unofficial judges was 36 to 5 in favor of the Affirmative.

HOW IT HAPPENED TO HAPPEN

SOME of our friends can not understand how we could select judges for the New York evolution debate who could vote 17 to 12 in favor of the fundamentalist. In fairness to Prof. McCabe we should explain. The original plan was to have 16 judges selected by EVOLUTION, 16 by friends of Dr. Riley, and 1 by mutual agreement. The afternoon of the debate we had secured our 16 acceptances, but only 5 of Dr. Riley's Committee had accepted. So, with our consent, he invited a long list of friends, and since he could not tell beforehand which ones would come we agreed to pass them all through at the front door with the understanding that the proper number would be selected to sit as judges when they arrived backstage.

Not all of the judges selected by EVOLUTION showed up, but enough of Dr. Riley's friends arrived to bring the total list up to 29. The gentleman in charge of the stage did not know one from the other and seated them all. There was some discussion regarding the matter when the vote was about to be taken, but it was then too late to do anything about it, and Dr. Riley is entitled to all the consolation that he can derive from the judges' decision under the circumstances.

NEW BOOKS

MODERN SCIENTIFIC KNOWLEDGE, edited by Frederick A. Cleveland. Ronald Press, $4.50.

This one-volume Outline of Modern Science deserves reading. Unlike that otherwise excellent "Outline" by Thomson (adequate only as an "Outline of Biology"), it really covers the whole field. Written originally by a number of authors, its several sections vary in excellence, but remain popular throughout. One would expect marked gaps and duplications in a symposium of this sort, but it has been so well edited and obviously rewritten that it has the continuity and coherence of single authorship.

The introductory section deals appreciatively with the scientific method and the place of science in modern life and thinking. The contrast with the unscientific thinking of the theological and other "absolutists" is forcefully set forth in a way that leaves little to be desired.

Much of the material is necessarily "old stuff," but very properly emphasis is placed on recent scientific developments. The chapters on atomic physics and chemistry, on the colloidal state of matter and on genetics are noteworthy. Especially so are those on Psychology, in which the viewpoint is illuminatingly evolutionary and behavioristic, as is suggestively indicated by each of several chapter headings containing the words "adjustive mechanism." It is to be regretted that the inconsequential chapters on Personality and especially those on Sociology do not continue this keynote, but lapse into a static and legalistic treatment that fails completely in outlining the really basic achievements in social science, and so finish most weakly a valuable book otherwise excellently conceived and done.

The text is sparingly, yet adequately, illustrated with well chosen and pertinent drawings from a wide range of sources. Nearly every chapter is followed by bibliographies and review questions for the benefit of the more thorough student. Each question is stated suggestively and followed by a brief list of references. In addition there are two general bibliographies with each chapter, one for popular reading, the other technical. These special features add much to the value of the volume as a textbook and as a busy man's guide to the basic facts and principles of modern scientific knowledge.

A. S. B.

WHO WOULD?

No wonder science puzzles us,
Such noble names it plies;
Who'd ever dream ichneumondes
Were tiny, tiny flies?—Ex.

OLD CIVILIZATIONS OF THE NEW WORLD. By A. Hyatt Verrill. Bobbs-Merrill Company, 393 pages. Illustrated. $5.

The most fascinating and at the same time the most perplexing field of archaeology is the study of the pre-history of Central and South America. Henry George's words, "Behind dead empires, dim ghosts of empire loom," were never more aptly applied than to the vast ruins and remains of Mexico, Panama, Colombia, Honduras, Ecuador, Bolivia, and Peru. The casual reader who fancies that all of American archaeology is comprised in a survey of the Mayas, the Aztecs, and the miscalled Incas, with a side glance at the Mound Builders, the Cliff Dwellers, and a few other extinct peoples of our own continent, is due for both a shock and a thrill in Dr. Verrill's absorbing and enlightening book.

Who were the Coclé dwellers, whose city Dr. Verrill himself discovered? Who were the Chimus? The Chibchas? The Tiahuánacans? The Pre-Incans? The Toltecs—if such a race ever existed? The Nascas? The builders of the pink porphyry cities of Peru? Where did these various peoples come from? When did they flourish? Why was their empire destroyed in each case, and when? Why is there in no instance any gradual development of a culture, but utterly dissimilar civilizations appear full-grown, without antecedents? Why were the tropics, where progress is usually slowed up, in America the scene of the greatest civilizations, whereas temperate South and North America displayed no such phenomenon? Were any of these peoples related or culturally connected, and if so, which?

These and many other questions Dr. Verrill can answer only by saying, "We do not know. In a day or a year we may discover the answer, but at present the problem is insoluble." One thing he does know, however, and gives the evidence for—the vast antiquity of man, and of civilized man, in America.

"Old Civilizations of the New World" is written by a man who is not only a real authority on his subject, but also a rarely interesting writer. In dealing with the better known civilizations, those of the Aztecs, the Mayas, and the Inca dynasty of Peru, he is no less enthralling in his narrative than when he is revealing for the first time in popular form the known facts of the still more mysterious and obscure peoples of South America. Discoverer not only of Coclé, in Panama, "the Pompeii of America," but also of the only wheels known in the remains of prehistoric America, and, in his earlier work as a zoologist, of the supposedly extinct *Solenodon paradoxus*, in Santo Domingo, and of the strange bearded Indians of Bolivia, he seems to have a genius for bringing to light new and pregnant finds in two distinct branches of science.

Diffidently I suggest a possible explanation of one of his minor mysteries in this book. In commenting on the impossibility that such work as must have been done by several of these extinct races could have been accomplished with the very crude stone implements which alone are found with them—work which ranges from absolutely true fitting of massive stone building blocks, or intricate lacework designs cut out of solid rock, to engraved gold beads smaller than the head of a pin—Dr. Verrill states that he finds no possible explanation why, granting that metal instruments might have disappeared (though this is improbable if they were deposited with the finds, for even feather-work and textiles are preserved in that dry atmosphere), the badly made stone tools and weapons should be there at all. Is it not possible that they were left just because they were useless—because they were ancient, or imitations of the ancient, and had a religious significance? Most of these ruins are of temples, and we know to this day how outworn customs and implements are still retained in church ritual. The workers, in other words, took their developed tools home with them; but the stone axes used by their remote ancestors had a place of honor at the altar.

Be that as it may, a book like this fires one to wonder and contemplation. "Old Civilizations of the New World" is literally a truly inspiring work.

Maynard Shipley.

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When will the world realize that in evolution it has taken an adder to its bosom? Will it awake to the truth before its lifeblood is completely drained by the serpent it now fondles?—Editorial in *Signs of the Times,* March 19, 1929.

We congratulate the people of Arkansas upon what they have accomplished for the protection of the faith and morals of the youth of their state by decreeing that they shall not be taught that they are the descendents of the brutes. And we congratulate them because they had the keenness to foresee the baleful effect of the teaching of this brutal doctrine upon their youth.—Dr. R. A. Meek in the Southern Methodist.

They (evolutionists) put everything in the universe on the basis of natural law, and inevitably, therefore, the supernatural phases of Christ and His life—His deity, His miracles, His incarnation, His atonement, His bodily resurrection—must be discarded by them... The rejection of the supernatural is a direct blow to Christianity. All religion is supernatural... But more particularly, the current movement away from the supernatural is absolutely fatal to Christianity. *Christianity is the most supernatural of all the religions of the world.*—A. L. Baker and F. D. Nichol, from book "Creation—Not Evolution," pages 119-120.

The One who made the heavens, the world, and man, was the One who gave us the Bible. The Maker knows the thing He has made. There can be no mistake when He speaks of the laws of Nature, because He instituted those laws. God gave us the Bible as a textbook in salvation, not in astronomy, zoology, or physiology: but when He sees fit to cite a fact from these fields, He knows whereof He speaks. The evolutionists should check up by Him, not He by them; for as the heavens are higher than the earth, so are His ways higher than their ways, and His thoughts than their thoughts.—Same, p. 152.

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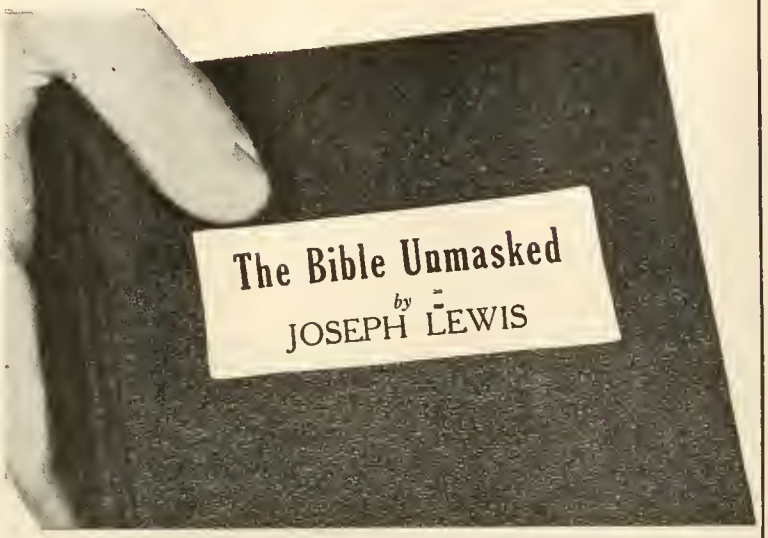

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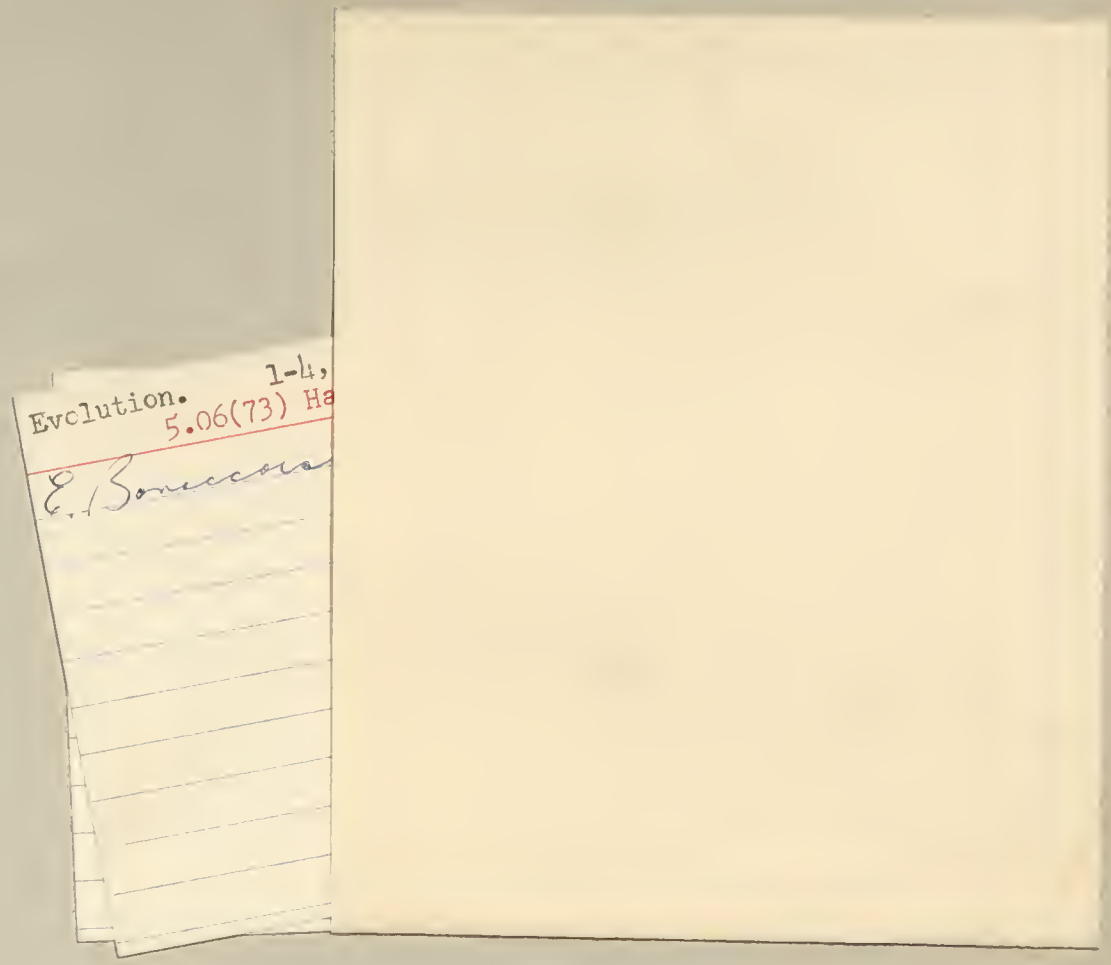

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